

pupæ, for, though several times alluded to in the text, no description of them is given. Although incomplete, they have given a great impetus to the study of lepidopterous relationships, and it is not every reader that has time or opportunity for turning them up in the *Transactions* where they appeared.

The system followed in the Heterocera is that given in Sir George Hampson's "Fauna of British India—Moths," but it has the manifest disadvantage that it does not include two or three of the families referred to. On p. 432 the Prodoxidæ are called a family, though they are clearly intended to be included in the family Tineidæ. The use of the same term and ending for an aggregate and its subdivision tends to confusion.

Mention of the Lepidoptera leads naturally to the subject of mimicry. So far as facts are concerned, Dr. Sharp brings forward many interesting examples, among them an unrecorded case of the larva of a British bug, *Nabis lativentris*, which mimics an ant, the resemblance being absent in the imago. On the other hand, no reference is made to some of the astounding and comparatively little known resemblances found among Membracidæ. In a species allied to one, *Heteronotus trinodosus*, which is figured, the prothoracic prolongation takes on the form of the entire body of a Hymenopterous insect, so that the Membracid walks about under a mask, or rather, a false body, of the most deceptive kind.

Dr. Sharp is, however, averse from countenancing any theory of the subject, and his brief account of existing hypotheses is scarcely impartial. In a singular criticism he writes:

"In endeavouring to realise the steps of the process of the development of the resemblance we meet with the difficulty that the amount of resemblance to the model that is assumed to be efficient at one step of the development, and to bring safety, is at the next step supposed to be inefficient and to involve destruction."

This appears either to involve a non-comprehension or to imply a complete negation of the principles of natural selection; we do not know whether the latter is intended.

Of the remaining chapters, that on Diptera is of especial value, on account, not so much of their intrinsic interest, great as that is when once the repugnance to their study has been overcome, as of the help it gives towards obtaining a fair general knowledge of an Order which does not form as a whole the subject of popular monographs, and of which the study is particularly difficult.

In view of the economic importance of Diptera, it is greatly to be regretted that they do not absorb more of the entomological energy that is wasted in investigating trifles that lead to nothing. With Dr. Sharp's account, it is possible at least to make a start.

Economic questions, which would have led the author outside the scope of this work, are seldom referred to. With this necessary exception, it is difficult to find a subject of any importance in entomology that is not, in some place or other, touched on more or less fully, and often in the light of independent observation and research. Very few forms of real interest are omitted; but among them is that of *Dyscritina*, on the life-history of which Mr. E. E. Green has lately thrown light.

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Though his paper was published since the appearance of Vol. v. of this series, reference might have been made in the short appendix to the present volume to his account of this Forficulid larva, which so singularly modifies our knowledge of the earwigs.

We do not recollect to have before met with the word "exstulpate," which Dr. Sharp is rather fond of using to denote the extruding of an eversible papilla. If it is a latinised form of the German "ausstülpfen," it can hardly be considered as an ornament to the English language!

It remains to allude to the illustrations; these are as good as, though relatively fewer than, those in the preceding volume. The figures of *Ornithoptera paradisea*, one of the few butterflies selected for figuring, are not successful. Exquisite as this insect, at least the male, is, it does not look well in a woodcut, and these large blocks look coarse and inappropriate on so small a page.

W. F. H. BLANDFORD.

#### A COMPREHENSIVE GEOGRAPHY.

*The International Geography.* By Seventy Authors.

Edited by Hugh Robert Mill, D.Sc. Pp. xx + 1098.

With 488 illustrations. (London: George Newnes, Ltd., 1899.)

SOME forty years ago geography was the most dreary of subjects in school lessons. Its text-books were as arid as the Sahara, lists of names and compilations of statistics; mere cram, without a single statement or principle which could help the learner to understand the history either of the earth or its inhabitants; useful as exercise for the memory, but baneful in every other respect. All that has been changed. Geography is now taught as illustrative of principles. Like geology, it is an application of a group of the natural sciences to explain a particular problem, the history of the earth; differing however, from that in dwelling more on the superficial aspect—the physiography—of our globe, and less on underlying causes or on the remote past. The volume before us is an example of the new method. Though too large for direct use as a text-book in schools, for it consists in all of over 1100 pages of rather closely-printed type (which ageing eyes will wish thicker), it will filter down to the classes through the teachers. The first part of the work deals with the principles of geography, the more distinctly scientific aspect of the subject, in a series of excellent essays, which treat of the principles and progress of geography, its relation to mathematics, the making of maps, the plan of the earth and the features of its surface, the ocean, atmosphere and climate, the distribution of life, including the races of man, and the political aspect of geography; all these subjects being discussed by very high authorities. Each of the following parts is devoted to one of the great divisions of the earth, treating it first as a whole, and then under its minor natural or political divisions, in a series of separate articles, each of which is contributed by "a specialist or recognised authority of high standing."

To review critically such a book as this demands something like geographical omniscience, to which I have no pretensions; probably the editor himself is about the only really competent person, and he might be not unnaturally suspected of a certain prejudice. So I have

tried to look at a few sections from the point of view of personal knowledge, and others from that of ignorance; for in the one case I might test the information, in the other regard the book as a learner. For the former purpose I have read in a carping spirit. Not that I hold it right to do this with a really good book. Horace lays down the true rule, "Ubi plura nitent in carmine non ego paucis offendar maculis"; but I did it, and now give the results to show that the book will stand a test which is almost unjust. A short glossary of rock names and some other geological terms would be a useful addition for the sake of the unlearned. In the course of my reading I have found one misprint, "Apls" for Alps, which is very likely due to that familiar of the printer who should be out of place in a chapel. Editors are not always responsible for press errors. However, here they must be few indeed. In mentioning Suess' idea that sometimes it is rather the ocean which has sunk than the land which has risen, a writer says that the 100-foot beach-line in Western Scotland

"maintains its level, lying on rocks of different ages and hardness, and crosses undisturbed great faults and dislocations."

But if the antiquity of the faults, as is the case here, is much greater than that of the beaches, the last reason is not conclusive, for the mass might be so far welded together as to move as a whole. But is the fact itself certain? If it be so, it does away with an objection commonly urged against the marine origin of the parallel roads of Glenroy. At any rate it should have been added that in Norway, not to mention other parts of the northern hemisphere, a beach level often varies in height. Perhaps, also, a little too much prominence is given to the theory of the earth's tetrahedral figure, for it is still on its trial, and apparently fails, as the author admits, to explain every fact. On p. 57 boulder clay is said to be an accumulation left by ice-sheets or in extra-glacial lakes. As not a few persons who have carefully studied the subject maintain that some boulder clay has been deposited in the sea, and have added proofs which have been met only by hypotheses, that view also should have been mentioned as a third possibility. In another aspect of ice-work, one author (p. 258) boldly abandons glacial excavation to account for the origin of the Alpine lakes, and attributes them, rightly as I believe, to crust movements; yet we are told on p. 272 that the lakes of the Alpine foreland are clearly related to the great ice-sheet which once overspread it. We presume this signifies glacial excavation; but, if so, what about the "hinter land"? Again, has it yet been *proved* (see p. 269) that the Scandinavian ice-sheet extended over northern Germany? It is, no doubt, an article of faith with a large school; but as difficulties suggest themselves to a sceptical mind after examining the ground, a less positive statement would have been better. As regards the Alps, it is not a happy phrase to speak of the Finster Aarhorn, Jungfrau, Mönch, Wetterhorn, &c., as

"grouped in one compact mass of snows and rugged peaks *round* the valleys of Lautebrunnen and Grindelwald";

for nothing can be more striking than the apparent ending, of those valleys at the foot of that great mountain wall. We find no mention of the Viso among the Italian Alps, yet no peak is more conspicuous than it from the Piedmontese plain; and the fact that the south-eastern Alps near the Austro-Italian frontier—so remarkable in their scenery—are magnesian limestone is not clearly stated.

The Pelvoux (p. 237) is not over 13,000 feet high, for only two peaks in the Dauphine group, the Ecrins and the Meije, exceed that elevation. To say that "since historic times not the slightest eruption has taken place in Auvergne" assumes a controverted point. In Italy the remarkable group of the Carrara mountains is not distinguished so clearly as it should be from the rest of the Appennines, and to say that Pozzuoli "stands in the midst of vast ruins of the Roman period" is not quite the most accurate of phrases.

Enough however of such criticisms, for they are so trivial as to be hardly worth mention. We only write them down to show how difficult, even if one tries to carp, it is to find any fault. When we come to excellencies their name is legion. With seventy contributors, all of whom have done their work well, it is almost invidious to select, but we may mention Prof. De Lapparent's article on the physical geography of France as no less lucid in statement than powerful in grasp, and those on Natal, the Transvaal and the Orange Free State, by the Right Hon. J. Bryce (which we naturally selected to look at from the standpoint of general ignorance), as singularly clear and informing. The book must have cost Dr. Mill no little toil as editor. Organisation and correspondence in a work like this must have been heavy tasks; and besides these he has himself contributed some excellent articles, and translated wholly or partially those of seventeen contributors. We heartily congratulate him on the final result. He deserves our gratitude for giving us a geography which is at once good in literary form and invaluable for reference, far in advance of any similar work which has been produced in this country. No teacher, indeed no advanced student, can afford to be without it; more than this, it must be on the shelves of every important library, and will be of the greatest use to literary as well as to scientific men, indeed to all who read for the love of culture. T. G. BONNEY.

#### CHEMISTRY FOR THE PEOPLE.

*Einführung in die Chemie in leichtfasslicher Form.*

Von Prof. Dr. Lassar-Cohn. Pp. xi + 299. (Hamburg and Leipzig: Leopold Voss, 1899.)

THIS book begins with an interesting *apologia*. When the author first took up the work of teaching in Volkshochschulen he lectured to the pupils very much in the same way that he himself had been lectured to in the University during his first semester. He soon came to think, however, that this was a mistake, and that a class of people, meeting in the evening hours for the improvement of their general knowledge, should not be treated like students taking up a professional study. He therefore altered the form of his lectures, and endeavoured to present a more general and expansive view of chemistry, and to impart, as it were, the